HISTORIC PROPERTY INVENTORY FORM

State of Washington, Department of Community Development
Office of Archaeology and Historic Preservation
111 21st Avenue Southwest, Post Office Box 48343
Olympia, Washington 98504-8343 (206)753-4011

INDENTIFICATION SECTION

Field Site No. 3745-A **OAHP No.** _____ **Date Recorded** 26 Oct 1994
Site Name Historic Electron Accelerator Building Revised 30 July 1997
Common Accelerator Laboratory
Field Recorder M.E. Crist, K.A. Simmons, I.C. Lindsay, D.W. Harvey
Owner's Name U.S. Department of Energy, Richland Operations Office
Address P.O. Box 550
City/State/Zip Code Richland, WA 99352

Status

- [x] Survey/Inventory
- [ ] National Register
- [ ] State Register
- [ ] Determined Eligible
- [ ] Determined Not Eligible
- [ ] Other (HABS, HAER, NHL)
- [ ] Local Designation

Photography HCRL
Photography Neg. No. Roll 181, frame 27-32
(Roll No. & Frame No.)
View of All exterior facades
Date 26 October 1994

Photo at right: Roll 181, frame 30
View of south and east facades

Classification [ ] District [ ] Site [x] Building [ ] Structure [ ] Object
Distric Status [x] NR [ ] SR [ ] LR [ ] INV
Contributing [x] **Non-Contributing** [ ]
District/Thematic Nomination Name Hanford Site Manhattan Project and Cold War Era Historic District

Description Section
Materials & Features/Structural Types

Building Type Industry
Plan Rectangular
Structural System Steel and Concrete
No. of Stories One

Roof Type

- [ ] Gable
- [ ] Hip
- [x] Flat
- [ ] Pyramidal
- [ ] Monitor
- [ ] Other (specify)
- [ ] Gambrel
- [ ] Shed

Cladding (exterior Wall Surfaces)

- [ ] Log
- [ ] Horizontal Wood Siding
  - Rustic/Drop [ ]
  - Clapboard [ ]
- [ ] Wood Shingle
- [ ] Board and Batten
- [ ] Vertical Board
- [ ] Asbestos/Asphalt
- [ ] Brick
- [ ] Stone
- [ ] Stucco
- [ ] Terra Cotta
- [x] Concrete/Concrete Block (both)
- [ ] Vinyl/Aluminum Siding
- [ ] Metal (specify) _____
- [ ] Other (specify) _____

Roof Material

- [ ] Wood Shingle
- [ ] Wood Shake
- [ ] Composition
- [ ] Slate
- [x] Tar/Built-up
- [ ] Tile
- [ ] Metal (specify) _____
- [ ] Other (specify) _____
- [ ] Not visible

Foundation

- [ ] Log
- [ ] Post & Pier
- [ ] Stone
- [ ] Brick
- [ ] Not visible
- Concrete
  - [ ] Block
  - [x] Poured
  - [ ] Other (specify)

Integrity (Include detailed description in **Description of Physical Appearance**)

		Intact	Slight	Moderate	Extensive
Changes to plan		x			
Changes to windows		x			
Changes to original cladding			x		
Changes to interior				x	
Other (specify)					

LOCATION SECTION

Address Building 3745-A, 300 Area
City/Town/County/Zip Code Richland/Benton County/99352
Twp. 10 N **Range** 28 E **Section** 11 **1/4 Section** NW **1/4 1/4 Sec** NW
Tax No./Parcel No. **Acreage**
Quadrangle or map name Richland, Washington Quad. - 7.5 min. series, 1986
UTM References Zone 11 **Easting** **Northing**
Plat/Block/Lot
Supplemental Map(s)

High Styles/Forms (Check one or more of the following)

- [ ] Greek Revival
- [ ] Gothic Revival
- [ ] Italianate
- [ ] Second Empire
- [ ] Romanesque Revival
- [ ] Stick Style
- [ ] Queen Anne
- [ ] Shingle Style
- [ ] Colonial Revival
- [ ] Beaux Arts/Neoclassical
- [ ] Chicago/Commercial Style
- [ ] American Foursquare
- [ ] Mission Revival
- [ ] Spanish Colonial Revival/Mediterranean
- [ ] Tudor Revival
- [ ] Craftsman/Arts & Crafts
- [ ] Bungalow
- [ ] Prairie Style
- [ ] Art Deco/Art Moderne
- [ ] Rustic Style
- [ ] International Style
- [ ] Northwest Style
- [ ] Commercial Vernacular
- [ ] Residential Vernacular (see below)
- [x] Other (specify) Industrial Vernacular

Vernacular House Types

- [ ] Gable Front
- [ ] Gable Front and Wing
- [ ] Side Gable
- [ ] Cross Gable
- [ ] Pyramidal/Hipped
- [ ] Other (specify) _____

NARRATIVE SECTION

Study Unit Themes (check one or more of the following)

[ ] Agriculture	[ ] Conservation	[ ] Politics/Government/Law
[ ] Architecture/Landscape Architecture	[ ] Education	[ ] Religion
[ ] Arts	[ ] Entertainment/Recreation	[x] Science & Engineering
[ ] Commerce	[ ] Ethnic Heritage (specify) _____	[ ] Social Movements/Organizations
[ ] Communications	[ ] Health/Medicine	[ ] Transportation
[ ] Community Planning/Development	[ ] Manufacturing/Industry	[x] Other (specify) Cold War Era
	[ ] Military	[x] **Study Unit Sub-Theme(s)** Research and Development

Statement of Significance

Date of Construction 1948 Architect/Engineer/Builder _____

[x] In the opinion of the surveyor, this property appears to meet the criteria of the National Register of Historic Places.

[x] In the opinion of the surveyor, this property is located in a potential historic district (National and/or local).

See Continuation Sheet

Description of Physical Appearance

See Continuation Sheet

Major Bibliographic References

See Continuation Sheet

Statement of Significance

Environmental monitoring and personnel health and safety has been a consistent theme surrounding the history of operations at the Hanford Site. Research and development programs were implemented to improve radiation monitoring capabilities and research the effects of radiation on biological tissues. The 3745-A Electron Accelerator Building was built in 1948 to house shielded laboratory space for health physics research involving ion bombardment in support of General Electric Hanford Company's Radiological Physics Group. The building and equipment were subsequently used in support of Battelle Northwest/Pacific Northwest Laboratories' Occupation and Environmental Safety Department.

Figure 1: 3745-A Building in 1953

A 2 million volt (MV) Van de Graaff accelerator and controls console were installed in 1953 to provide high dose x-ray exposure for routine calibration of dosimetry and hand-held, high range radiation monitoring instruments used at the Hanford Site, replacing an x-ray machine which could not be operated reliably at the high doses required. The original console underwent considerable technological modifications since the 1970s. The accelerator was later modified to provide high dose rate irradiation for studies of biochemical mechanisms in mammalian cells. The 0.5 MV positive ion Van de Graaff accelerator, acquired in the 1970s, was a type often used for materials research and analytical work. This accelerator, originally used by Westinghouse Hanford Company in conjunction with a high energy electron microscope, was excessed and obtained by Battelle for use in low energy atomic cross section measurements (Braby 1994).

Periodic health physics safety surveys conducted by Battelle, like one performed in 1969, led to the upgrade of the flashing lights and start-up horns on the building's roof used to alert 300 Area personnel that the accelerator was in use. Additional physical barriers and internal shielding were used to achieve a maximum dose rate of less than 2 millirems per hour within and around the 3745-A Building during accelerator operations (Zimmerman 1969).

A project proposed in late 1994 would have transferred the 2 MV electron Van de Graaff accelerator and associated equipment into a planned addition to the 331 Life Sciences Building. Budget constraints, however, led to the termination of the accelerator program in 1995, after which the particle accelerators were sold and transferred to Texas A & M University. In 1997, Washington State University, Tri-Cities began leasing the 3745-A, 3746, and 3746-A Buildings for their experimental physics program. The 3745-A Building will be used primarily for storage space.

Though the accelerators and associated equipment were the most important features in the 3745-A Building, essential to the research and experiments involving the calibration of instruments used for radiation protection and monitoring, their relocation does not adversely affect characteristics that make 3745-A eligible for the National Register. The accelerators in the 3745-A Building made a significant contribution to health physics activities in the 300 Area. It is therefore the conclusion of the U.S. Department of Energy that Building 3745-A is eligible for inclusion in the National Register of Historic Places under Criterion A as a contributing property within the Hanford Site Manhattan Project and Cold War Era Historic District.

Physical Description

Exterior

Building 3745-A is a rectangular building with concrete block walls and an on-grade concrete slab floor that measures 73 feet long in an east to west direction by 17.5 feet wide in a north to south direction. The roof is concrete with a tar and gravel finish. The center of this building consists of a high bay section the designers believed would be necessary to house a vertical standing accelerator. Two boarded-up louvers on the east side of the high bay, and HVAC systems

are located on either side of the high bay. Fixed, multipane windows are located on the east and west ends of the building. The main entrance to this building (a single, metal door) is located on the east wall. The south exterior wall is composed of concrete block that has been augmented with poured concrete for radiation shielding purposes. This poured concrete extends outward 18 inches from the building's concrete block walls. The west wall is composed of concrete block that has been similarly reinforced with poured concrete shielding. The shielding helped reduce the amount of radioactive energy that escaped the building during accelerator operations. At the western end of the north elevation is a reinforced concrete wall off-set from the building that shields a roll-down, corrugated metal bay door.

Interior

Building 3745-A is divided into three rooms. The eastern portion of the building was the control room, and contained the control equipment (consoles) for the ion accelerator. From the control room one enters the center of the building, the electron accelerator room, that has 3-foot thick concrete end-walls and 8-inch concrete block side walls. The room has a high bay that was modified with the installation of a false ceiling. Above this false ceiling is a steel I-beam from which a large monorail and hoist/crane was suspended in order to move and position the Van de Graaff ion accelerator. A large floor drain is located in the floor of this room to drain cooling water during testing. To the west of the high bay room is a storage room with a large roll up corrugated bay door located on its north side.

The 2 MV Van de Graaff accelerator is about 3 feet in diameter and 7 feet long, essentially a self-contained source of high energy particles. The accelerator is attached to a large system of vacuum pumps, beam lines, bedding magnets, lenses and scattering chambers and electronics. Due to changing experimental needs, modifications to the machines and associated support equipment (e.g., consoles) began soon after installation. By the time the building was shut down, the configuration differed considerably from the original installation.

Major Bibliographical References

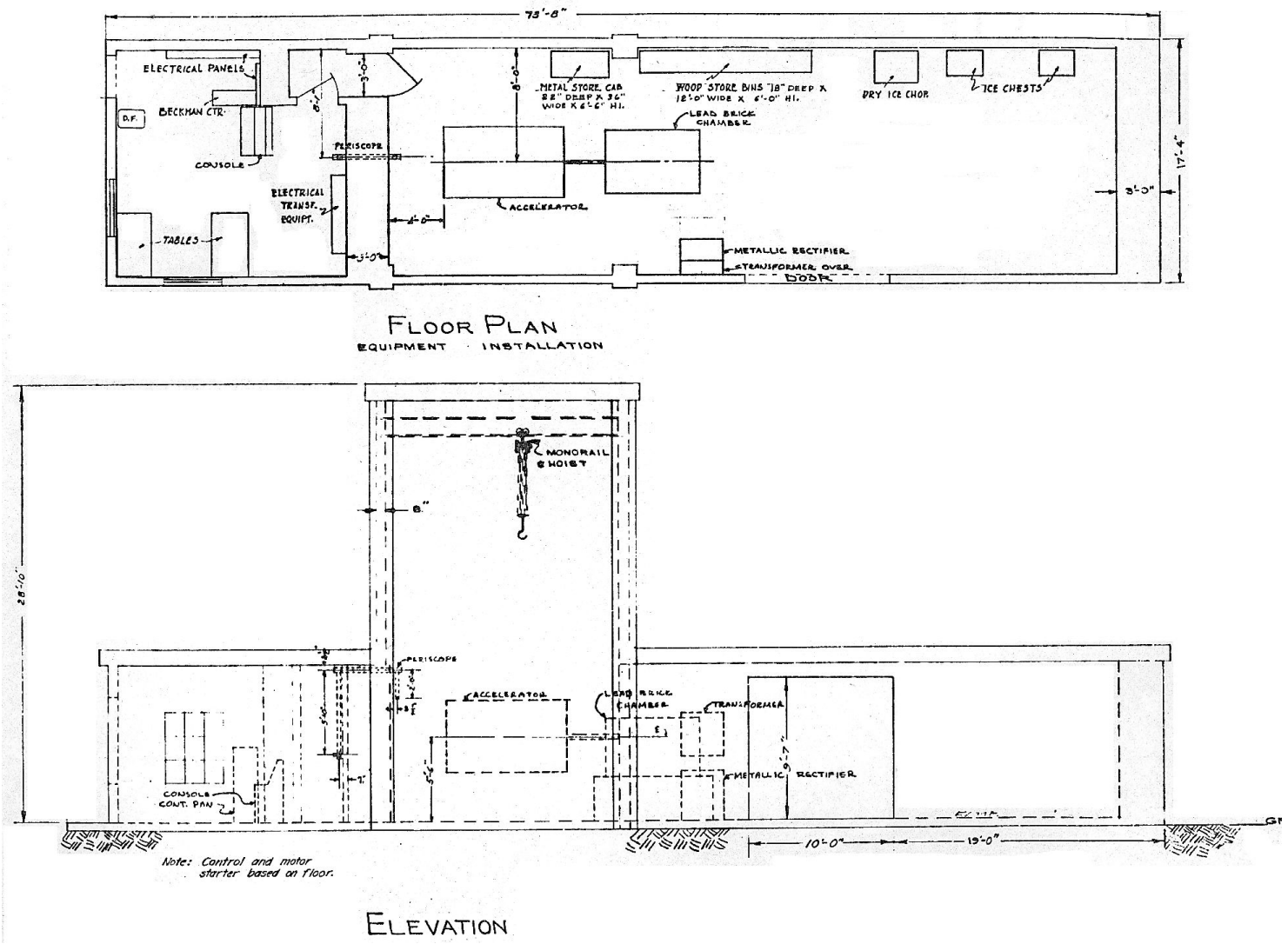
Battelle Facilities Administration. *Facilities Catalog*. PNL-MA 587, Battelle, Pacific Northwest Laboratory, Richland, Washington.

Braby, Leslie. 1994. "Accelerator Relocation - Background Information [for 3745-A, 3745 B, 3746-A Buildings]." Richland, Washington.

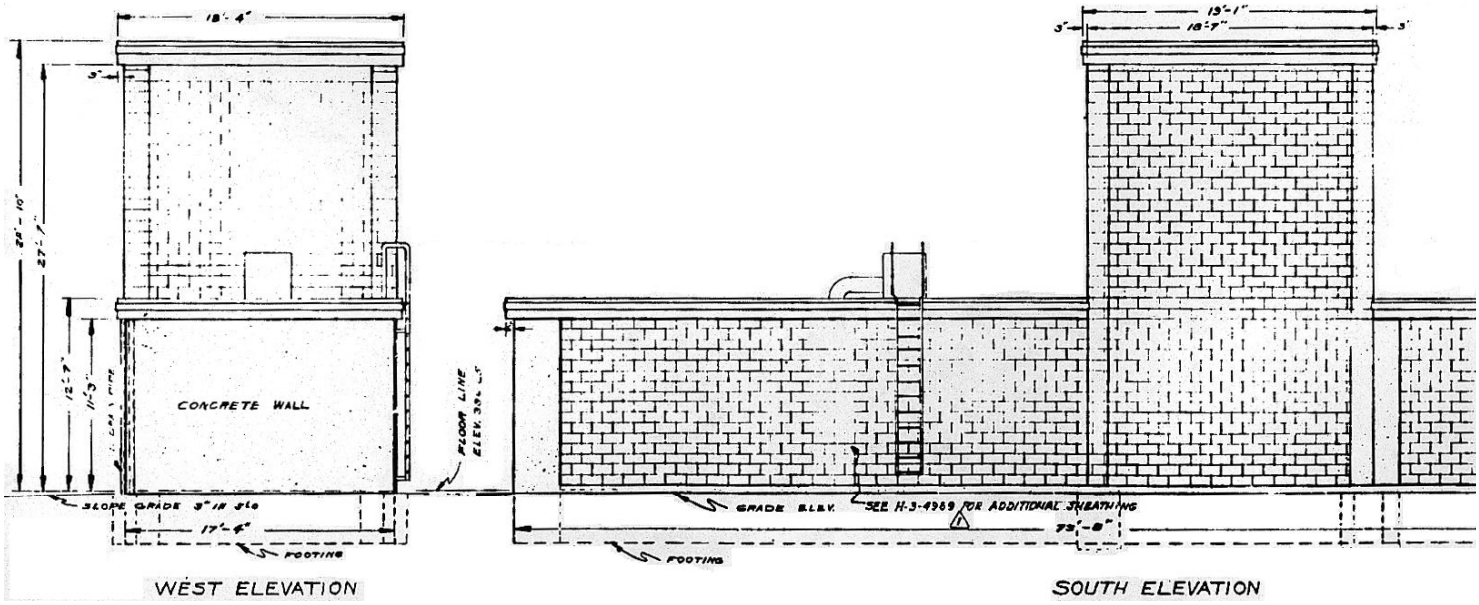
Drawing H-3-683.

Nichols, Lowell (Battelle physicist, retired). 7 August 1997. Personal Communication. Richland, Washington.

Westinghouse Hanford Company. *300 Area Site Asset Catalog*. Richland, Washington.



Drawing H-3-683: 3745-A Building Architectural Plan and Equipment Layout, 1947



Drawing H-3-792: 3745-A Building Architectural South and West Elevations, 1948